

## **IN THE CLAIMS**

Please amend the claims as follows

1-16. (canceled)

17. (currently amended) A non-naturally occurring composition of matter comprising a protein complex possessing nucleic acid polymerase enhancing activity, the complex comprising a plurality of subunits wherein at least one subunit is a *P. furiosus* protein selected from ~~at least one of~~:

a protein encoded by a nucleic acid having the nucleotide sequence of SEQ ID NO: 70 or a nucleic acid that hybridizes to the complement of the nucleic acid having the nucleotide sequence of SEQ ID NO: 70, wherein the hybridization conditions comprise incubation in 5x SSC and 50% formamide at 42°C, and washing in 0.1x SSC and 0.1% sodium dodecyl sulfate at 60°C; and

a protein having a sequence of amino acids comprising the amino acid sequence of SEQ ID NO:71.

18-45. (canceled)

46. (currently amended) An antibody that binds to a protein having an amino acid sequence ~~comprising~~ consisting of at least one of SEQ ID NO: 19 and 71.

47-58. (canceled)

59. (previously presented) A protein produced from a cell containing a DNA construct comprising a sequence encoding the amino acid sequence of SEQ ID NO: 71 operably linked to an expression vector, wherein the protein is in monomeric, dimeric, or multimeric form.

60. (previously presented) The protein of claim 59, wherein the cell is a bacterial cell.

61. (previously presented) A polymerase-enhancing complex comprising the protein of claim 59.

62. (previously presented) An antibody that binds to the protein of claim 59.

63. (currently amended) An antibody that binds to a protein ~~comprising~~ consisting of the amino acid sequence of SEQ ID NO: 71, wherein the protein is part of the polymerase-enhancing complex of claim 61.

64. (previously presented) The protein of claim 59, wherein the protein is produced as a fusion protein.

65. (previously presented) The protein of claim 64, wherein the fusion protein comprises a calmodulin binding peptide.

66. (previously presented) The protein of claim 65, wherein the expression vector is pCAL-n-EK.

67-76. (canceled)

77. (previously presented) A non-naturally occurring composition of matter comprising a protein comprising the amino acid sequence of SEQ ID NO: 71.

78. (previously presented) The composition of matter of claim 77, wherein the protein is in monomeric, dimeric, or multimeric form.

79. (previously presented) The composition of matter of claim 77, wherein the protein is present in a protein complex.

80-84. (canceled)

85. (currently amended) A protein having polymerase-enhancing factor (PEF) activity comprising the amino acid sequence of SEQ ID NO: 73, wherein the protein is at least 39% similar to SEQ ID NO: 71.

86. (canceled)

87. (currently amended) A PCR enhancing, protein extract comprising purified proteins from *Thermus thermophilis* ~~that~~ wherein at least one protein of the purified proteins from *Thermus thermophilis* possesses dUTPase activity.

88. (original) A composition comprising a protein extract as claimed in claim 87.

89. (original) A composition comprising a protein extract as claimed in claim 87, further comprising a thermostable DNA polymerase.

90. (currently amended) A protein extract of claim 87, ~~which comprises a protein that~~ wherein the at least one protein of the purified proteins from *Thermus thermophilis* which possesses dUTPase activity can be bound by an antibody specific for a recombinant *P. furiosus* protein ~~comprising~~ consisting of the amino acid sequence of SEQ ID NO: 71.

91. (original) A composition comprising a protein extract of claim 90 and a thermostable DNA polymerase.

92-94. (canceled)

95. (previously presented) A non-naturally occurring composition of matter comprising a polymerase-enhancing protein encoded by a nucleic acid that hybridizes to the complement of the nucleotide sequence nucleic acid of SEQ ID NO: 70, wherein

the hybridization conditions comprise incubation in 5x SSC and 50% formamide at 42°C, and washing in 0.1x SSC and 0.1% sodium dodecyl sulfate at 60°C overnight.

96. (canceled)

97. (original) A protein extract of claim 87, which comprises a protein that possess a molecular weight of approximately 24kD in an SDS-PAGE gel.